

## **Health Surveillance among Dutch Military Personnel during the United Nations Mission in Eritrea and Ethiopia**

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### **SUMMARY**

*Dutch troops participated in the United Nations Mission in Eritrea and Ethiopia from December 2000 until June 2001. All personnel (1089) received information on health risks, with emphasis on anti-mosquito personal protective measures. Malaria chemoprophylaxis comprised weekly mefloquine or daily doxycycline. Immunisations included meningitis A+C and yellow fever. When necessary boosters for diphtheria, tetanus and poliomyelitis (DTP), hepatitis A +B and typhoid were administered. During deployment the health surveillance showed a mean non-availability of 0.41 %. The mean consultation incidence was 18.6 per 1000 men days. The main diagnostic groups included: orthopaedics & injuries (24.9 %), dermatology (22.3 %) and miscellaneous (20.6 %). Two cases of p.f. malaria were diagnosed; 1 year after return 5 cases of plasmodium vivax malaria had shown up. In a post deployment questionnaire 76.6 % indicated consistent use of malaria chemoprophylaxis, 15.4 % inconsistent use, while 2.8 % never used at all. The use of bed nets scored: 31.6 % always, 42.8% irregular and 25.8 % never. About 30 % of the bed nets and 10 % of the uniforms proved to be impregnated. Consistent use of DEET was reported by 1.5 %, inconsistent use by 36.9 % and no use 61.6 %. Overall the non-availability remained very low but compliance to personal protective measures needs continuous attention.*

### **INTRODUCTION**

A Dutch military battalion participated in the United Nations Mission in Eritrea and Ethiopia (UNMEE) from December 2000 until June 2001. Because of possible health risks the troops were routinely monitored during and after deployment. Moreover it follows the recommendations of several political and scientific reports based on the experience with post deployment complaints among Dutch troops after several operational deployments. This study presents the results of the health surveillance during the mission and the outcomes of a post deployment questionnaire.

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## **STUDY POPULATION AND METHODS**

### **Study population**

The Dutch troops were part of a combined Dutch Canadian Battalion (NECBAT, n=1643) and were stationed in five campsite locations divided over the central part of Southern Eritrea (4) and Northern Ethiopia (1). Dutch troops comprised 1089 personnel (38 females) with a mean age of 28.4 years who stayed in theatre from 171200 until 030601. On departure all personnel were fit for duty.

### **Preventive measures**

All personnel received oral and written information on health risks several weeks before departure. Additional attention was paid to personal protective anti-mosquito measures such as use of long sleeves and trousers between sunset and dawn, insect repellent (diethylmethyلتoluamide: DEET 30 %), and permethrine impregnated uniforms and bed nets. On this latter it should be mentioned that this was the first approved impregnation of uniforms in Dutch troops. Due to national legislation permission was required from the Ministry of Agriculture, which was granted a few days before departure only. Therefore it could not be applied until arrival in theatre. Specific immunisations included meningitis A+C and yellow fever. When necessary booster vaccinations were administered for diphtheria, tetanus and poliomyelitis (DTP), typhoid, hepatitis A and B. First choice for malaria chemoprophylaxis consisted of weekly mefloquine (250 mg), alternatively daily doxycycline (100 mg) was offered for those who had experienced (possible) mefloquine adverse events during previous deployments. After return the troops received a personal medical check-up, including testing on tuberculosis.

### **Living conditions**

Troops stayed in tents on five campsite locations divided over the central part of Southern Eritrea (4) and Northern Ethiopia (1). The altitude of the campsites varied between 1500-2200 meters above sea level. Much attention was paid to hygiene such as prefab showers, toilets and dining facilities. During deployment food and bottled potable water were required from approved distributors. All had a 2-week midterm rest and recreation leave which was spent in The Netherlands. One or two supervised day-breaks were organised locally.

### **Medical support**

The medical support plan was based on a paper risk assessment and a pre-deployment fact finding mission in Eritrea. Medical facilities in theatre included first line sickbays (BME) and one centrally located second echelon field hospital (FDS) offering surgical, X-ray, ward and additional laboratory facilities. Medical personnel received specific training in tropical medicine. In addition to ground ambulance support dedicated helicopter capacity for medical evacuation was available in theatre. The Royal Netherlands Airforce provided out of theatre medical evacuation. A preventive medicine team performed regular hygienic controls and occupational health expertise was available on call in The Netherlands.

### **Health surveillance**

Data collection was performed in several ways. During deployment all consultations, diagnoses and lost working days were entered into the international EPINATO system. This widely used basic database divides

all consultations over some 24 diagnostic groups. Data were collected on all campsite locations on a weekly base. After initial scanning on site by the chief medical officer, monthly figures were sent to the Netherlands for further examination. Due to restrictions of EPINATO some outcomes, such as non-availability and consultation rate had to be derived. However in addition to EPINATO, the national naval database on disease and injury registration (GIFKOM) was used. This “on line” system provided more accurate information, but for this study it was used as control system only. Finally the personnel office (J-1) provided valuable information on the daily number of soldiers on site and repatriation figures.

About 14 days after return to the Netherlands all participants had an individual medical check up by a doctor. Before this examination troops were asked to fill in a post deployment questionnaire containing questions on their health and compliance to preventive medical policies.

### Statistical analysis

This study is restricted to the registration data only. The incidences are expressed per 1,000 person-days. Lost men days are expressed as a percentage of the total observation days. Post deployment questionnaires were analysed with SPSS.

## RESULTS

### Health surveillance

The mean number of personnel in Eritrea and Ethiopia was 915 (range 759 – 1089). A total of 148,841 person-days in theatre were registered. The mean non-availability due to medical reasons was 0.41% of the total population (range 0.22 – 0.64%). The mean overall consultation incidence was 18.6 (range 13.8 – 21). Additionally the consultation rates, indicating the percentage of the study population that consulted the medical system per month, were derived. From the GIFKOM-database we learned that there was an average of 1.2 consultations per diagnosis. Based on the EPINATO results this indicated that some 39% of the study population visited the local sickbays at least once every month.

In EPINATO all consultations were divided into several diagnostic groups. By the end of the mission the top 3 consisted out of “Orthopaedics & Injuries” (24.9%), “Dermatology” (22.3%) and “Miscellaneous” (20.6%). During the deployment one case of malaria falciparum was diagnosed. After return in The Netherlands another case of *p.f.* malaria was diagnosed (5 days after return) and up to one year after return 5 cases of *plasmodium vivax* malaria could be attributed to the participation in UNMEE.

Finally a total number of 25 repatriations to The Netherlands for medical reasons were registered. The main reasons for repatriation were 12 “orthopaedics & Injuries (48%) and 7 “mental disorders” (28%). Seven out of the 12 repatriations for orthopaedics & injuries returned to Eritrea before the end of the mission. None of the mental disorders returned to Africa, however by the end of the mission 6 were serving again on a different location.

### Post deployment questionnaire

From the 982 troops that returned to the Netherlands 776 (755 males and 21 females) could be seen for a post deployment medical check up 14 days after return in the Marine Barracks in Doorn, The Netherlands. Before troops were seen by a doctor on an individual base they filled in a post deployment questionnaire, which was

used as guideline for the medical check-up. In this questionnaire 76.7 % indicated consistent use of malaria chemoprophylaxis, 15.4 % reported inconsistent use, while 2.8 % never used at all. Concerning bed nets: 31.6 % always used a bed net, 18.2 % mostly, 24.4 % sometimes and 25.8 % indicated non use. About 30% of the bed nets and 10 % of the uniforms proved to be impregnated. Consistent use of DEET was reported by 1.5%, inconsistent use by 36.9% and 61.6% indicated no use at all.

## **DISCUSSION**

The main outcomes of this study show that the collective non-availability remained very low and no serious diseases occurred during deployment. The type of study and the restrictions in registration do not allow clear explanations, however we believe that the adequate individual and collective preparations, such as infrastructure and hygienic and preventive medical measures contributed to this result. Furthermore the altitude of the campsites must have minimised the (nocturnal) risk for tropical infections. From anecdotal reports we learned that troops were more concerned about their cold weather sleeping bags than the consistent use of impregnated bed nets. This may well have influenced the poor results on the use of personal protective measures.

In this respect it is remarkable that we found such a high score on consistent malaria chemoprophylaxis. Based on previous experiences with reluctance to mefloquine we decided to offer troops different options. Mefloquine was the first option but doxycycline could be used as an alternative. Much attention was paid to information on the malaria chemoprophylaxis and this could well explain why the majority chose for mefloquine.

The registration findings over the different diagnostic groups were in line with other studies on health surveillance during peace support operations. Most musculoskeletal disorders were related to working conditions and physical training. Because of strict traffic rules the number of road accidents remained very low. The daytime tropical conditions explained the high number of skin disorders. The only tropical related infections we experienced were individual cases of travellers diarrhoea. The number of dental complaints remained very low. We attribute this to a consistent preventive dental policy in the Dutch Navy.

The finding on poor compliance to personal protective measures are reason for concern. We already mentioned the altitude of the campsites as one of the possible explanations for this result. Furthermore this was the first mission which allowed the impregnation of bed nets and uniforms. The strict legal rules and late permission must have influenced the low scores.

In conclusion, despite numerous health risks, this part of Africa remained very benign to the Dutch troops. Health monitoring will remain a integral part of the medical support plan for military missions, however the registration methods need further refinement.